USB 2.0 Ranger® 2104

High Speed Extender System

User Guide

Powered by ExtremeUSB®

Thank you for purchasing the Ranger 2104.

Please read this guide thoroughly before installation.

This document applies to Part Numbers: 00-00234 through 00-00236.

FCC Radio Frequency Interference Statement Warning

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Statement

We, Icron Technologies Corporation, declare under our sole responsibility that the Ranger, to which this declaration relates, is in conformity with European Standard EN 55022/A1 Class A, and EN 50082-1 (IEC 801-2, IEC 801-3, IEC 801-4)

IC Statement

This Class A digital apparatus complies with Canadian ICES-003.
©2008 Icron Technologies Corporation. All rights reserved. Icron Technologies Corporation, the Icron Technologies Corporation logo, and the Icron Technologies Corporation products referred to herein are either the trademarks or the registered trademarks of Icron Technologies Corporation. All other trademarks are property of their respective owners. Icron Technologies Corporation assumes no responsibility for errors that may appear in this manual. Information contained herein is subject to change without notice.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, mechanical, electronic, photocopying, recording, or otherwise, without prior written permission of Icron Technologies Corporation. Document #90-00524-A01

Contents

Introduction **3**
Ranger Product Contents 3
Requirements 3
About the Ranger 3

Installation guide **6**
Installing the LEX unit 6
Installing the REX unit 6
Connecting the LEX unit to the REX unit 7
Checking the Installation 7
Connecting a USB Device 8

Troubleshooting **8**
Specifications **10**

Limited Hardware Warranty **11**
Hardware Remedies **11**
Limitation of Liability **11**
Obtaining Warranty Service **12**
Contacting Technical Support **12**
Technical Glossary **14**

Introduction

This manual is intended to assist IT professionals install the Ranger 2104. The instructions in this guide assume a general knowledge of computer installation procedures, familiarity with cabling requirements, and some understanding of USB devices.

NOTE: Notes provide additional information that could be useful.

CAUTION: Cautions provide important information about an operational requirement.

Ranger 2104 Product Contents

Your Ranger 2104 is packaged with:

- Ranger 2104 Quickstart Guide - located on the outer box sleeve (90-00478)
- LEX unit (Local Extender)
- REX unit (Remote Extender)
- REX DC power adapter (1)
- Warranty card

An additional DC power adapter may be purchased for the LEX unit in the event that your USB port can not supply the required 500mA current. Please contact an Icron Sales representative for further details (See Page 15)

Requirements

To complete the installation, you will also require the following items that are not included with the product:

- USB 1.1 or 2.0 compatible computer (Host computer) with a USB compliant Operating system
- USB 1.1 or 2.0 compatible device
- Category 5e Unshielded Twisted Pair (UTP) cable with two RJ45 connectors (if using surface cabling), OR, Category 5e UTP cabling with two information outlets and two Category 5e UTP patch cords with RJ45 connectors (if using premise cabling)

All references to Category 5e UTP cable in this document represent the minimum requirement. Category 6 or better UTP or STP cable may be substituted.

About the Ranger 2104

The Ranger 2104 incorporates Icron's patented ExtremeUSB® technology, enabling users to extend beyond the standard 5m cable limit for USB peripheral devices. With the Ranger 2104, USB devices can be located up to 100 meters from the computer.

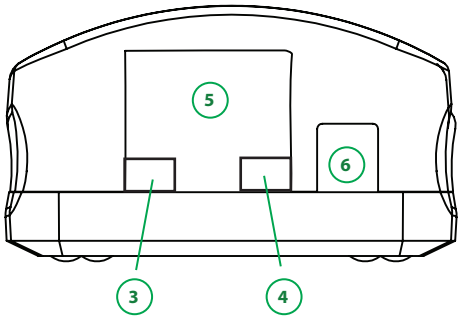
The Ranger is composed of two individual units; the LEX unit and the REX unit.

The Power/Config port on LEX and REX can only be used with the included proprietary Ranger 2104 DC adapter. No USB devices can be connected or used on the port.

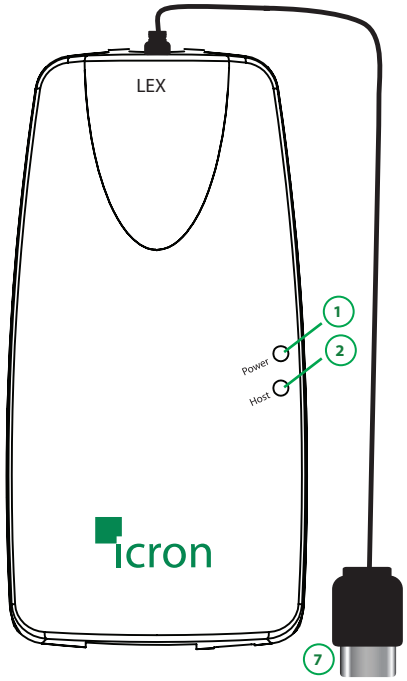
The LEX unit

The LEX unit connects to the computer using the attached USB cable. Power for this unit is provided by the USB on the host PC. .

Back View



Top View

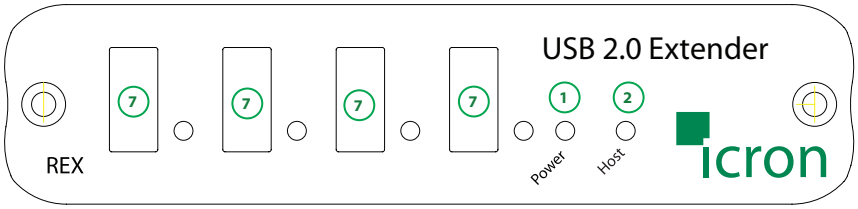


ITEM	TYPE	DESCRIPTION
1	Power LED (Blue)	Light on when power is supplied. Off when no power is supplied.
2	Host LED (Green)	Light on when Host computer is detected and connected to LEX.
3	Link LED (Green) on RJ45	Indicates connectivity between LEX and REX. Lights on both LEX and REX when link between units is established. Off when there is no link between LEX and REX.
4	Activity LED (Amber) on RJ45	Indicates activity on RJ45 port. Blinks intermittently when data is transmitted between LEX and REX.
5	Extension Link Port (RJ45)	Accepts RJ45 connector for CAT5e UTP cabling (or better).
6	Power/Config port	Connects to the DC Power supply on REX only.
7	USB Type A male connector	Used to connect the LEX unit to the host computer.

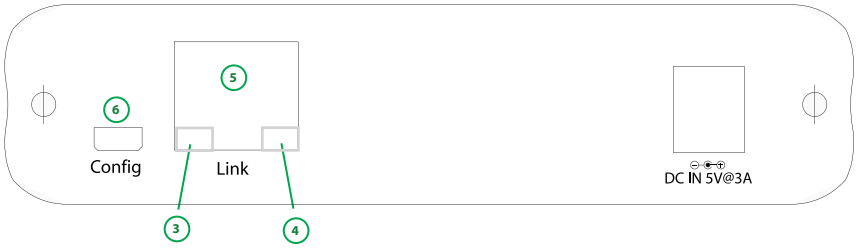
The REX Unit

The REX unit provides a USB A port for standard USB devices. The REX unit allows you to connect four USB devices directly. Additional devices may be connected by attaching the USB hubs to the REX unit.
The REX unit is powered by an external DC adapter and can supplies up to 500mA on each USB port.

Front View

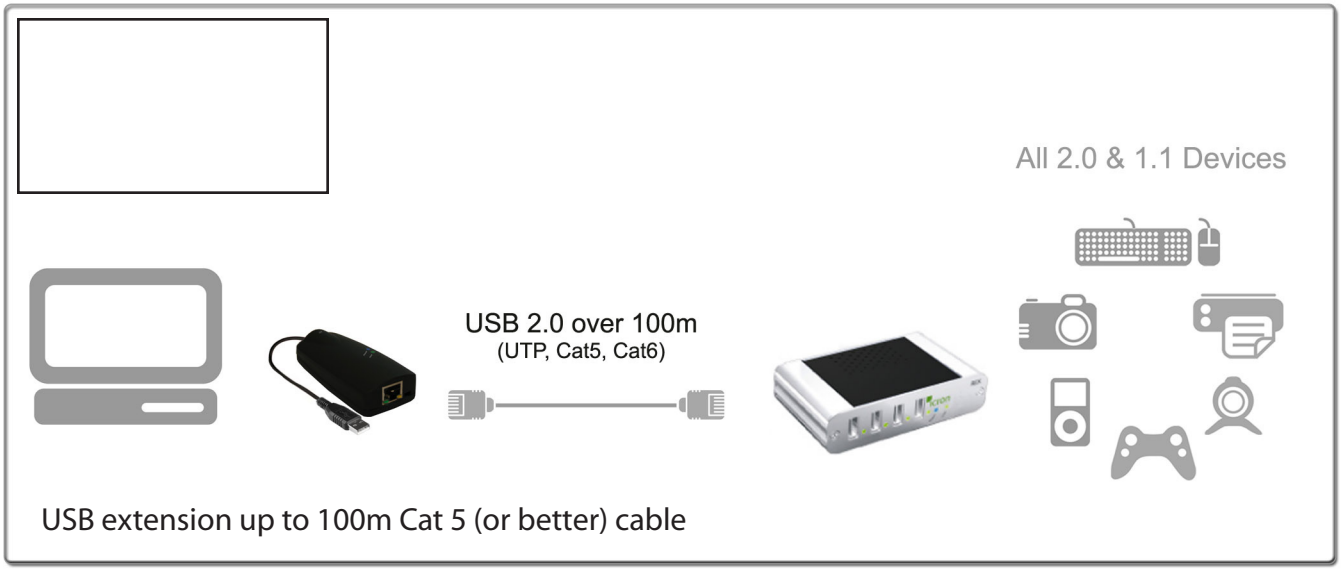


Rear View



ITEM	TYPE	DESCRIPTION
1	Power LED (Blue)	Light on when power is supplied. Off when no power is supplied.
2	Host LED (Green)	Light on when a USB device is attached to REX and connection is established.
3	Link LED (Green) on RJ45	Indicates connectivity between LEX and REX. Lights on both LEX and REX when link between units is established. Off when there is no link between LEX and REX.
4	Activity LED (Amber) on RJ45	Indicates activity on RJ45 port. Blinks intermittently when data is transmitted between LEX and REX.
5	Link Port (RJ45)	Accepts RJ45 connector for CAT5e UTP cabling (or better).
6	Power/Config port	Connects to the DC Power supply.
7	Device Port (USB Type A female port)	USB device connection.
8	Power port	Connects to the DC Power supply.
9	Device LED (Green)	Indicates when a USB device is connected to the Device Port. Solid green when device is plugged in and active. Off when device is in suspend mode or REX unit is powered off.

Installation guide



Before you can install the Ranger 2104, you need to prepare your site.

1. Determine where the computer is to be located and set up the computer.
2. Determine where you want to locate the USB device(s).
3. If you are using surface cabling, ensure you have enough Category 5e UTP cabling to connect the two locations to the maximum distance of 100m supported by device.

   OR

   If you are using premise cabling, ensure Category 5e UTP cabling is installed between the two locations, with Category 5e information outlets located near both the computer and the USB device(s).

Installing the LEX unit

1. Place the LEX unit near the computer.
2. Plug the Type A male connector on the LEX into a USB port on the computer.

Installing the REX unit

1. Place the REX unit near the USB device(s).
2. Plug the power adapter into a suitable AC outlet.
3. Connect the power adapter to the REX unit.

! Use only the DC adapters supplied with the Ranger. Use of substitute adapters may cause permanent damage to the system and will void the warranty.

Connecting the LEX unit to the REX unit

note To ensure proper operation, it is recommend that only Category 5e or better, Unshielded Twisted Pair (UTP) cabling be used to connect the LEX unit to the REX unit. The UTP cabling must have a straight-through conductor configuration with no crossovers, and must be terminated with 8 conductor RJ45 connectors at both ends. The combined length of any patch cords using stranded conductors must not exceed 10m.

With Surface Cabling

1. Plug one end of the Category 5e UTP cabling (not included) into the Link port (RJ45) on the LEX unit.
2. Plug the other end of the Category 5e UTP cabling into the Link port (RJ45) on the REX unit.

With Premise Cabling

1. Plug one end of a Category 5e patch cord (not included) into the Link port (RJ45) on the LEX unit.
2. Plug the other end of the patch cord into the Category 5e information outlet near the Host computer.
3. Plug one end of the 2nd Category 5e patch cord (not included) into the Link port (RJ45) on the REX unit.
4. Plug the other end of the 2nd patch cord into the Category 5e information outlet near the USB device.

note The maximum length of the Category 5e UTP cable, including patch cords, must not exceed 100 meters. The combined length of any patch cords using stranded conductors must not exceed 10m.

Checking the Installation

1. Check that the Power, Host and Link LED's are on and that the Activity LED is blinking. If the Link LED and Activity LED are permanently off then the cabling between the LEX and REX unit is not installed properly or is defective.

2. For Windows users (2000, XP, or Vista) open Device Manager to confirm that the Ranger has installed correctly. Expand the entry for Universal Serial Bus controllers by clicking the + sign. If the Ranger has been installed correctly you should find it listed as a Generic USB Hub.

   To open Device Manager in Windows 2000 or XP:
   Right click "My Computer" then select: Properties >> Hardware tab >> Device Manager button

   To open Device Manager in Windows Vista:
   Open the Start menu, right click on "Computer" then select: Manage >> Device Manager

3. For Mac OS X users open the System Profiler to confirm that the Ranger has installed correctly. In the left hand column under Hardware, select "USB" and inspect the right hand panel. If the Ranger has been installed correctly you should find it listed as a Hub under the USB High-Speed Bus/USB Bus.

4. If the Ranger is not detected correctly or fails to detect please consult the Troubleshooting Guide.

note To open System Profiler in OS X: Open the Finder, select Applications, then open the Utilities folder and double click on the System Profiler icon.

Connecting a USB Device

1. Install any software required to operate the USB device(s). Refer to the documentation for the USB device(s), as required.
2. Connect the USB device to the Device port on the REX unit.
3. Check that the Device is detected and installed properly in the Operating System.

Compatibility

The Ranger 2104 complies with USB1.1 and USB 2.0 specifications governing the design of USB devices. Icron Technologies Corporation does not, however, guarantee that all USB devices are compatible with the Ranger as there are a number of different configurations that may impact the operation of USB devices over extended distances.

Troubleshooting

The following table provides troubleshooting tips. The topics are arranged in the order in which they should be executed in most situations. If you are unable to resolve the problem after following these instructions, please contact technical support for further assistance.

PROBLEM	CAUSE	SOLUTION
All LEDs on LEX unit are off.	The LEX unit is not receiving enough power from the USB port or the (optional) LEX DC adapter.	1. Ensure that the Type A USB connector from LEX to Host computer is properly inserted directly in a USB port. 2. Move the LEX Type A USB connector to another USB port on the Host computer.
All LEDs on REX unit are off	The REX unit is not receiving power from the DC adapter	1. Ensure that the DC power adapter is properly connected to the REX unit. 2. Check that the DC adapter is connected to a live source of electrical power. 3. If the Ranger does not power on, contact technical support for assistance.
Link LEDs on LEX unit and REX unit are off.	There is no connection between the LEX unit and REX unit.	1. Ensure that a Category 5e UTP cable (or better) with straight-through conductors is connected between the LEX unit and REX unit. 2. Connect a short replacement Category 5e patch cord between the LEX unit and REX unit to deter mine the defective Category 5e UTP cable or RJ45 termination.

PROBLEM	CAUSE	SOLUTION
Link LED for RJ45 on LEX unit is on, Host LED on LEX unit is off	• The Host computer is not powered on. • The LEX unit is not connected to the computer (when used with the optional LEX AC adapter) • The computer does not support USB hubs. • The Ranger is malfunctioning	1. Disconnect all USB devices from the REX unit. 2. Disconnect the LEX unit from the computer. 3. Reconnect the LEX unit to the computer. 4. In the Universal Serial Bus controllers section of Device Manager, check that the Ranger is recognised as a "Generic USB Hub". 5. If the Ranger is not recognised, contact technical support for assistance.
Ranger units were working but the Host LED on REX unit is suddenly blinking	The REX unit is in suspend mode. The Operating System may put the Ranger in suspend mode when the computer is put into a Suspend/Standby state or when no USB devices are attached.	1. Recover/Resume the Operating System from Suspend/Standby mode (see your system's Operating documentation). 2. Attach a USB device to the Ranger.
All LEDs on both the LEX unit and REX unit are on but the USB device does not operate correctly or is detected as an "Unknown Device" in the Operating System.	• The USB device is malfunctioning. • The computer does not recognise the USB device. • The application soft ware for the device is not operating. • The Ranger 2104 is malfunctioning.	1. Disconnect the Ranger from the computer. 2. Connect the USB device directly to the USB port on the computer. 3. If the device does not operate properly, consult the user documentation for the device. 4. Update your system chipset or USB Host controller drivers from your System/Mother board manufacturer's website. 5. If the device operates properly when directly connected to the computer, connect another device (of a different type) to the Ranger. Connect the Ranger to the computer. 6. If the second device does not operate, the Ranger 2104 may be malfunctioning. Contact technical support for assistance. 7. If the second device does operate properly, the first device may not be compatible with the Ranger 2104. Contact technical support for assistance.

USB device is attached to REX USB port but REX device LED is off.	• A USB device must have the appropriate driver installed on the computer operating system. • The USB device is drawing more current than allowed by USB specification (>500mA).	1. Install the required USB device driver on the computer operating system prior to attaching the USB device to the REX unit. Please see your USB device manufacturer's website for details. 2. Consult your USB device documentation and power your USB device with the additional, USB device manufacturer supplied, power supply (if available).

Frequently Asked Questions

Please visit Icron's website for answers to FAQ's: http://www.icron.com/products/usb/faq.php

Specifications

Range	100 meters over Category 5e UTP (or better) stranded or solid conductor cable
USB device support	High-speed devices (480 Mb/s) (USB 2.0) Full speed devices (12 Mb/s) (USB 2.0 & 1.1) Low speed devices (1.5 Mb/s) (USB 2.0 & 1.1)
USB hub support	Any single chain can include up to 4 USB hubs plus one Ranger.
USB host support	EHCI (USB 2.0) and OHCI/UHCI (USB 1.1)
Maximum USB devices supported (Incl. USB Hubs)	14 USB Devices including any additional USB hubs connected to the REX.
DC adapter(s) **! Use only the DC adapter provided**	Input: 100/240 V AC, 50 – 60 Hz Output: 5 V DC, 1.5 A
DC adapter connector	8-pin Icron custom connector
Power available to USB device at REX unit	500 mA
USB cable (LEX to Host computer)	0.15 meters (0.49 ft)
LEX unit USB connector	1 x USB Type A male connector
LEX unit Link connector	1 x RJ45
REX unit Link connector	1 x RJ45
REX unit USB connector	1 x USB Type A port
LEX unit dimensions	43.72 mm x 87 mm x 24 mm (1.72" x 3.43" x 0.95")
LEX unit weight	0.06 kg (0.13 lbs)
LEX power consumption	500 mA Maximum
REX unit dimensions	43.72 mm x 87 mm x 24 mm (1.72" x 3.43" x 0.95")
REX unit weight	0.05 kg (0.11 lbs)
REX power consumption	Approx. 500 mA (No Load). 1A (Full load)
System shipping weight	0.18 kg (0.40 lbs)
Temperature range	0°C – 50°C
Regulatory testing	FCC Class A, IC, CE Class A, EMC EN-61000 4kV Contact, 8kV Air

Limited Hardware Warranty

Icron Technologies Corporation warrants that any hardware products accompanying this documentation shall be free from significant defects in material and workmanship for a period of one year from the date of purchase. Icron Technologies Corporation's hardware warranty extends to Licensee, its customers and end users.

Hardware Remedies

Icron Technologies Corporation's entire liability and the Licensee's exclusive remedy for any breach of warranty, shall be, at Icron Technologies Corporation's option, either (a) return of the price paid or (b) repair or replacement of hardware, which will be warranted for the remainder of the original warranty period or 30 days, whichever is longer. These remedies are void if failure of the hardware has resulted from accident, abuse, or misapplication.

Limitation of Liability

The hardware warranty set forth in this agreement replaces all other warranties. Icron Technologies Corporation expressly disclaims all other merchantability and fitness for a particular purpose and non-infringement of third-party rights with respect to the hardware.

Icron Technologies Corporation dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty. Under no circumstances will Icron Technologies Corporation, its suppliers or licensors be liable for any costs of procurement or substitute products or services, lost profits, loss of information or data, or any other special, indirect, consequential, or incidental damages arising in any way out of the sale of, use of, or inability to use Icron Technologies Corporation product or service, even if Icron Technologies Corporation, its suppliers or licensors have been advised of the possibility of such damages. In no case shall Icron Technologies Corporation, its suppliers and licensors' liability exceed the actual money paid for the products at issue.

Because some jurisdictions do not allow the limitation of implied warranties of liability for incidental, consequential, special, or indirect damages, the above limitation may not always apply.

The above limitations will not apply in case of personal injury where and to the extent that applicable law requires such liability.

Obtaining Warranty Service

To obtain warranty service, you must contact Icron Technologies Corporation within the warranty period for a Return Material Authorization (RMA) number. Icron Technologies Corporation will not accept returns without an authorized RMA number. Be sure you have the serial numbers of the LEX unit and REX unit units before calling. Package the product appropriately for safe shipment and mark the RMA number on the outside of the package. The package must be sent prepaid to Icron Technologies Corporation. We recommend that you insure it or send it by a method that provides for tracking of the package. The repaired or replaced item will be shipped to you, at Icron Technologies Corporation's expense, not later than thirty days after Icron Technologies Corporation receives the defective product.

Address the returned product to:

RMA Coordinator
Icron Technologies Corporation
4664 Lougheed Highway, Suite 221
Burnaby, BC V5C 5T5 Canada

Tel: 1-604-638-3920

Contacting Sales

Email: sales@icron.com
Tel: 1-604-638-3920

Contacting Technical Support

Email: techsupport@icron.com

To help us serve you better, please include the following information with your technical support request:

- Host computer make and model
- Type of operating system installed (e.g. Windows XP, Mac OS X, etc.)
- Part number and serial number of both LEX unit and REX unit
- Make and model of any USB device attached to the Ranger
- Description of the installation
- Description of the problem

NOTES

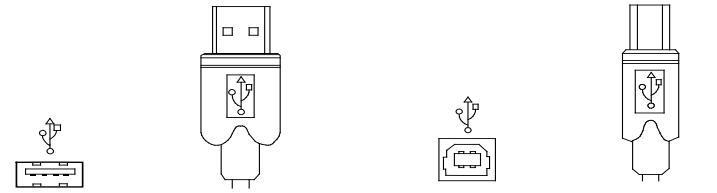
Technical Glossary

Category 5e (CAT5E) Network Cabling

Category 5 cable is commonly also referred to as CAT5. This cabling is available in either solid or stranded twisted pair copper wire variants and as UTP (Unshielded Twisted Pair) or STP (Shielded Twisted Pair). UTP cables are not surrounded by any shielding making them more susceptible to electromagnetic interference (EMI). STP cables include shielding over each individual pair of copper wires and provides better protection against EMI. Category 5 has been succeeded by Category 5e cabling which includes better support for high speed communications and reliability.

USB Cables

USB cables have two distinct connectors. The Type A connector (male) is used to connect the cable from a USB device to the Type A port (female) on a computer or hub. The Type B connector (male) is used to attach the USB cable to a USB device.



RJ45

The Registered Jack (RJ) physical interface is what connects the network cabling (CAT5E) to the LEX unit and REX unit. You may use either the T568A scheme (Table 1) or the T568B scheme (Table 2) for cable termination as the Ranger uses all four pairs of the UTP cable. RJ45 connectors are also referred to as 8P8C connectors.

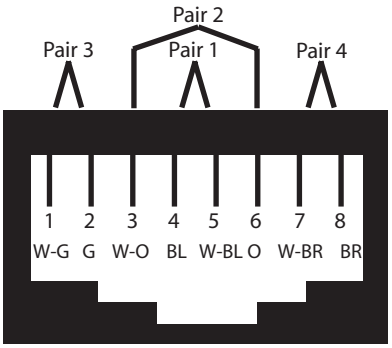
RJ45 Pin Positioning

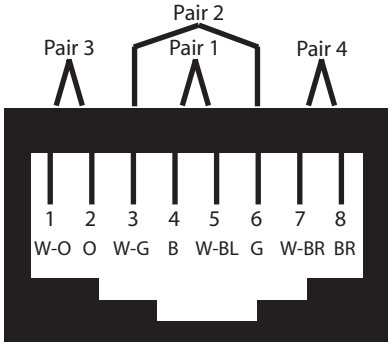
Table 1 - T568A Wiring

PIN	PAIR	WIRE	CABLE COLOR
1	3	1	WHITE/GREEN
2	3	2	GREEN
3	2	1	WHITE/ORANGE
4	1	2	BLUE
5	1	1	WHITE/BLUE
6	2	2	ORANGE
7	4	1	WHITE/BROWN
8	4	2	BROWN

Table 2 - T568B Wiring

PIN	PAIR	WIRE	CABLE COLOR
1	2	1	WHITE/ORANGE
2	2	2	ORANGE
3	3	1	WHITE/GREEN
4	1	2	BLUE
5	1	1	WHITE/BLUE
6	3	2	GREEN
7	4	1	WHITE/BROWN
8	4	2	BROWN





Icron Technologies Corporation
4664 Lougheed Highway, Suite 221
Burnaby, BC, V5C 5T5 Canada

Tel: 1-604-638-3920 Fax: 1-604-638-3930
www.icron.com